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ABSTRACT

Two college counseling samples, 150 males and 150 females, were administered two new interest inventories based on a similar factor structure. Considerable convergent and divergent validity for both was apparent in the correlations between the eight Vocational Interest Inventory scales and the 153 Strong-Campbell Interest Inventory General Theme, Basic Interest, and Occupational scales. Further, while the male counselees' interests departed significantly from Men-in-General toward female-stereotyped occupational interests, the female counselees' interests were essentially the same as Women-in-General, contrary to the prediction that a "new breed" of college women was developing vocational interests in traditionally male-stereotyped areas. (Author)

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**Construct Validity of the Strong-Campbell Interest
Inventory and the Vocational Interest Inventory
among College Counseling Clients**

Patricia W. Lunneborg

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Two college counseling samples, 150 males and 150 females, were administered two new interest inventories based on a similar factor structure. Considerable convergent and divergent validity for both was apparent in the correlations between the eight Vocational Interest Inventory scales and the 153 Strong-Campbell Interest Inventory General Theme, Basic Interest, and Occupational scales. Further, while the male counselees' interests departed significantly from Men-in-General towards female-stereotyped occupational interests, the female counselees' interests were essentially the same as Women-in-General, contrary to the prediction that a "new breed" of college women was developing vocational interests in traditionally male-stereotyped areas.

Construct Validity of the Strong-Campbell Interest Inventory and the Vocational Interest Inventory among College Counseling Clients

The purpose of this study was to provide evidence for the construct validity of two new vocational interest inventories, the Strong-Campbell Interest Inventory or SCII (Campbell, 1974) organized according to Holland's (1973) six personality dimensions, and the Vocational Interest Inventory or VII (Lunneborg, 1975) organized according to Roe's (1956) eight groups of occupations. Not only will the theoretical relationships of the VII scales to the SCII General Theme, Basic Interest, and Occupational scales be examined, but comparisons between the SCII male and female general reference samples and the two counseling samples used here will be discussed.

The following conceptual relationships should be found between the two schemes, listing first the Holland scale and then the Roe scale(s) which should be associated together and including the abbreviations used throughout this report: Realistic (R) with Technical (TEC) and Outdoor (OUT), Investigative (I) with Science (SCI), Artistic (A) with General Cultural (CUL) and Arts & Entertainment (ART), Social (S) with Service (SER), Enterprising (E) with Business Contact (BUS), and Conventional (C) with Organization (ORG). The only exception to these relationships anticipated here was in line with the higher correlation between CUL and S (.36) than between CUL and A (.27) obtained previously using Holland's (1970) Vocational Preference Inventory (Lunneborg and Lunneborg, 1975).

Method

The counseling samples consisted of 150 females and 150 males who sought vocational counseling at the University of Washington counseling center between October 1974 and December 1975. Clients assigned to take the SCII were invited to also take the VII for which they received an interest profile to be interpreted with their counselors. Data collection ceased when 150 cases for each sex had been obtained.

SCII and VII scores were coded by a research assistant, and checked by another research assistant, onto mark-sense data collection forms. Pearson product-moment correlations were then obtained separately for each sex between the eight VII scale scores and the six SCII General Theme scores, 23 SCII Basic Interest scores, and 124 SCII Occupational scale scores. Means and standard deviations for all scales were also computed.

Results and Discussion

Table 1 presents the means and standard deviations for the VII scales and SCII General Theme scales for each sex as well as the correlations among these scales. Considerable convergent and divergent validity is evident in accord with the conceptual relationships expected, even to the desired correlation of Roe CUL with Holland

Table 1

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Correlations between VII Scales and SCII General Theme Scales
among Counseling Clients^a

	VII scales		SCII general themes					
	Mean	SD	R	I	A	S	E	C
Females								
TEC	49.2	7.4	28	04	-20	-31	-23	-07
OUT	43.8	12.8	44	11	17	-13	-20	-32
SCI	47.2	11.2	14	44	-17	-09	01	16
CUL	59.7	11.4	-25	07	10	19	-10	-07
ART	51.8	11.2	-09	-04	57	-00	-11	-31
SER	50.8	10.7	-28	-25	-18	48	-05	-10
BUS	43.7	10.3	-21	-20	-10	-04	49	21
ORG	54.7	10.9	-18	-28	-34	-12	21	57
SCII Mean			47.1	48.4	54.2	51.1	48.7	48.9
SCII SD			9.1	8.6	8.3	8.3	8.5	10.7
Males								
TEC	52.4	9.9	62	26	-30	-17	03	34
OUT	47.0	10.3	37	04	-11	-04	-26	-11
SCI	46.7	11.5	-01	47	-08	-13	-21	-06
CUL	57.8	13.1	-43	-08	32	13	-25	-27
ART	49.4	11.3	-28	-05	57	02	-14	-32
SER	46.9	10.4	-09	-10	-05	55	-11	-19
BUS	49.5	12.2	-05	-28	-16	-11	58	13
ORG	50.4	10.6	-09	-30	-21	-18	39	53
SCII Mean			51.6	50.2	50.8	47.2	48.8	46.6
SCII SD			9.7	9.1	9.8	9.3	8.8	8.9

^aDecimal points omitted.

Artistic in the male counseling sample. The means for the two samples on the VII have been plotted in Figure 1 to illustrate how elevated, compared to a recent group of university graduates tested in high school, both male and female counselees were on the CUL scale, and how relatively depressed were their scores on BUS and OUT. Figure 1 also allows a comparison of the sex differences on the VII. Females were higher on SER, ORG, CUL, and ART; males higher on BUS, TEC, and OUT; the sexes were about equal in their SCI interest.

Campbell (1974) reports higher scores for males on the SCII for the General Themes of R, I, and E, and higher scores for females on A, S, and C, although this last difference was actually very slight. These sex differences have been well-established for the RIASEC framework, as individuals taking the Self-Directed Search are warned in interpreting their results (Holland, 1970, p. 14). Looking at Table 1 it can be seen that males were higher on R and I and females higher on A, S, and C. The difference in favor of men on the E scale was not present, although, as indicated above, they were higher than the women on VII BUS.

Table 2 is organized to show the concordance between the 23 SCII Basic Interest scales and the General Themes to which they were assigned on the basis of previous correlational data. In the few instances where the General Theme r predicted here to be highest was not, the highest r observed did not disagree with the data given in the Manual (Campbell, 1974). These instances were: (1) higher correlations with Military Activities (MIL) for the E and C Themes than for the R Theme to which MIL was categorized. As the Manual (p. 41) indicates MIL was moderately correlated with E and especially C in a test construction sample. (2) Domestic Arts was equally correlated with C as with S to which it belongs, but the Manual again confirmed such a relationship. (3) Law/Politics, classified as E, correlated higher with S among males, paralleling Manual data exactly. (4) Lastly, Public Speaking, classified E, correlated more highly with S and, among males, with A as well. The Manual again reveals such relationships were found in test construction.

The second half of Table 2 shows the concordance between the SCII Interest scales and the VII scales to which groups such interests theoretically would be classified, for example, in Roe's scheme SCII Basic Interests which belong in the ART group would be not only Art and Writing but also Athletics. How did Roe's scheme relate to the Basic Interest scales? It was in accord with prediction with the following exceptions: (1) Adventure, classified as OUT, and Mathematics, classified as SCI, correlated more highly with TEC among males. (2) Athletics, in ART, correlated more highly with OUT in both sexes. As a matter of fact, Athletics was negatively correlated with the ART scale. This may well be because of the 14 items

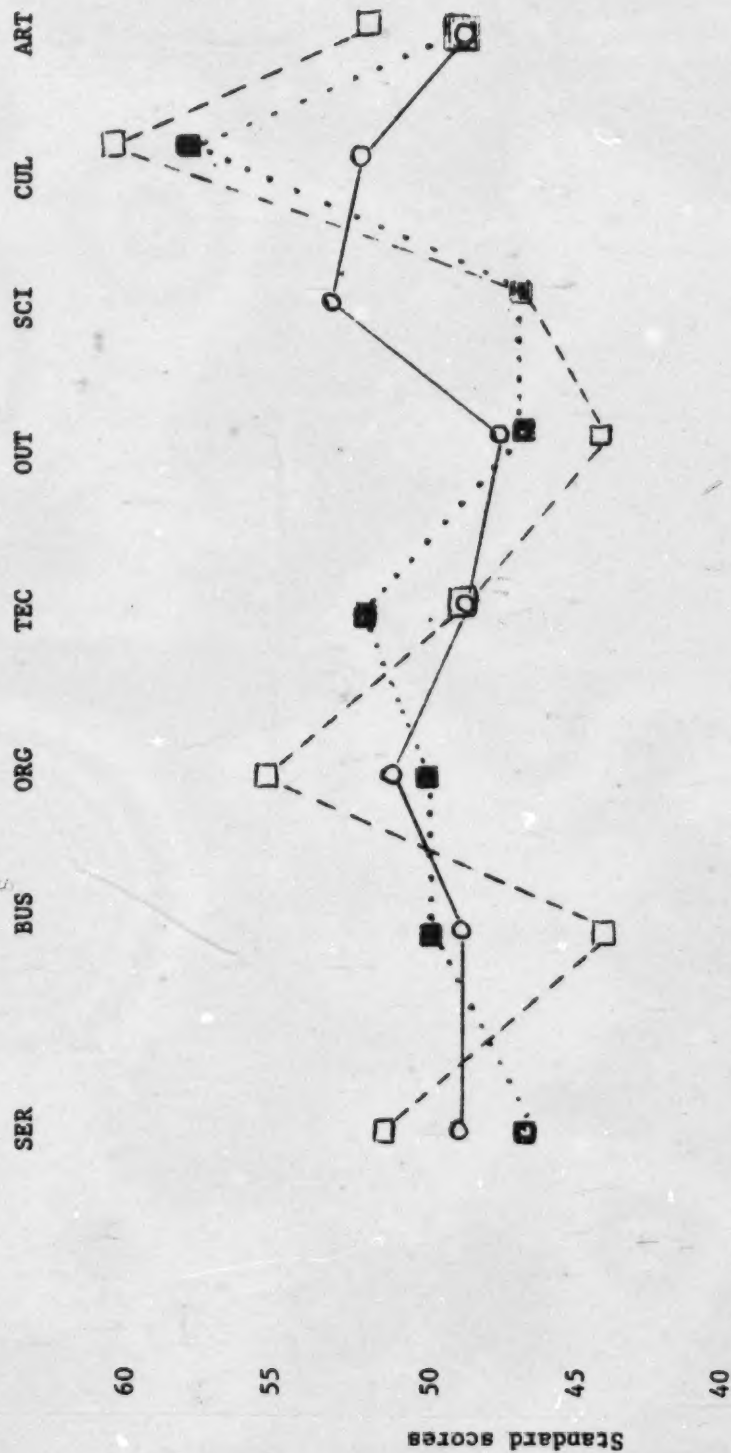


Figure 1. Comparison of female (N = 150) and male (N = 150) university counseling clients tested in college with sample of 1975 university graduates (N = 809) tested in high school.

Table 2

5

Correlations by Sex between SCII Basic Interest Scales with SCII General

Themes and VII Scales among Counseling Clients^a

Basic interest scale	General theme $\bar{r}$ predicted high		Highest $\bar{r}$ if prediction failed		VII scale $\bar{r}$ predicted high		Highest $\bar{r}$ if prediction failed	
	$\bar{r}_F$	$\bar{r}_M$	$\bar{r}_F$	$\bar{r}_M$	$\bar{r}_F$	$\bar{r}_M$	$\bar{r}_F$	$\bar{r}_M$
ADV	R	44	46		OUT	29	28	TEC 30
AGR	R	53	56		OUT	69	70	
MEC	R	89	88		TEC	34	62	
MIL	R	33	22	E34, C45	C 26	none	(ORG 23)	(ORG 18)
NAT	R	52	46		OUT	59	51	
MAT	I	55	60		SCI	24	28	TEC 39
MSC	I	70	57		SCI	58	55	
MSV	I	33	48		SCI	57	44	
SCI	I	88	88		SCI	53	51	
ART	A	79	89		ART	50	54	
MUS	A	81	84		ART	58	55	
WRI	A	74	83		CUL	43	57	
ATH	S	44	41		ART	-04	-09	OUT 20
DOM	S	48	50	C 49	SER	05	24	ORG 10
REL	S	68	58		SER	26	21	
SSV	S	84	78		SER	52	53	
TEA	S	71	70		CUL	41	33	SER 43
BUS	E	77	75		ORG	41	42	BUS 48
LAW	E	44	25		S 30	CUL	39	33
MER	E	83	86		ORG	31	40	BUS 42
PUB	E	52	21	(S 52)	A 40, S 41	CUL	28	37
SAL	E	84	87		BUS	53	65	BUS 32
OFF	C	83	77		ORG	57	58	

^aDecimal points omitted. F designates $\bar{r}$ for females, M $\bar{r}$ for males.

to this VII scale, only two are athletic -- "gymnastics coach" and "professional tennis player" being imbedded in lots of music, art, and drama. (3) Domestic Arts only correlated .05 and .24 with SER, its theoretically correct group, and had a slight relationship with ORG, very much like the $\bar{r}$ with C noted above for Domestic Arts. (4) Teaching, which in Roe's scheme belongs in CUL, correlated more highly with SER among males. (5) Perhaps the most serious discrepancies have to do with three E occupations classified on the basis of their SCII Manual descriptions as other than BUS: Business Management and Merchandising were both thought to belong to ORG; Public Speaking was thought to belong to CUL. But Business Management correlated more highly among males with BUS, Merchandising correlated more highly in both sexes with BUS, and Public Speaking correlated more highly with BUS among females.

The VII data are instructive with respect to the success of the new Basic Interest scales. All appear to be "working" except two. Military Activities, considered too amorphous in Roe's scheme to be classified, correlated most highly with ORG, paralleling its correlation with Holland's C. Perhaps with only five items, Military Activities is basically too unreliable, in addition to being no longer Realistic, for inclusion in the SCII. Second, Public Speaking found more support here for inclusion as an S scale than as an E scale, but looking at the VII correlations, among females it correlated .28 with CUL, .32 with BUS, and .09 with SER; among males it correlated .37 with CUL, .11 with BUS, and .15 with SER. Public Speaking, therefore, given the moderate correlations reported between it and four of the General Themes (Manual, p. 41) plus these VII results, does not seem to belong clearly, basically, anywhere.

Tables 3 and 4 are concerned with the overall agreement between Basic Interest and Occupational scales with the General Themes and Roe groups to which they have been classified. For each set of Basic or Occupational scales, e.g., for the five R Basic and 19 R Occupational scales, the mean correlation with each VII scale and General Theme scale has been computed. Table 3 contains these mean correlations for the female counselees. The predicted relationships of high correlation between convergent scales and low correlation between divergent scales were found on the SCII, with the "correct" correlations being stronger for the Basic sets than for the Occupational sets, e.g., the mean $\bar{r}$ for the five R Basic scales and the R Theme was .54 vs. a mean $\bar{r}$ of .46 for the 19 R Occupational scales and the R Theme. Table 4 with the mean correlations for the male counselees showed this same trend.

Looking first at the SCII, the Basic Interest scales which correlated most weakly with their appropriate General Themes were, among females, Military Activities and Medical Service; among males, Military Activities, Law/Politics, and Public Speaking (Table 2). The Occupational scales which correlated most weakly with their appropriate

Table 3

Mean Correlations for Basic Interest and Occupational Scales
Grouped by General Theme with VII Scales and General Themes
for 150 Female Counseling Clients

Basic scales	VII scales									General themes					
	TEC	OUT	SCI	CUL	ART	SER	BUS	ORG	R	I	A	S	E	C	
R (5)	13	35	11	-21	-01	-15	-13	-20	54	28	18	10	11	10	
I (4)	01	-02	48	-08	-16	-12	-08	-06	35	62	05	04	13	26	
A (3)	-18	09	-19	14	47	-15	-04	-26	14	24	78	15	17	-15	
S (5)	-13	00	-02	01	01	25	04	-09	18	04	11	63	30	24	
E (5)	-24	-24	-11	10	-06	04	38	19	04	07	10	39	68	40	
C (1)	-19	-30	12	-06	-32	02	22	57	09	-13	-23	27	41	83	
Occupational scales															
R (19)	15	12	25	-24	-22	-08	-03	02	46	25	-11	09	20	34	
I (33)	09	08	32	04	-03	-20	-20	-15	27	56	12	-16	-13	-02	
A (19)	-15	08	-26	27	41	-07	-06	-27	-16	04	53	-06	-11	-46	
S (20)	-34	-21	-08	21	01	29	14	-01	05	11	19	66	44	26	
E (20)	-20	-23	-06	00	-08	04	37	21	02	00	01	31	60	39	
C (13)	-07	-30	06	-09	-31	05	29	48	06	-16	-33	23	44	67	

Note. Decimal points omitted. Number of scales in each group in parentheses.

Table 4

Mean Correlations for Basic Interest and Occupational Scales
Grouped by General Theme with VII Scales and General Themes
for 150 Male Counseling Clients

Basic scales	VII scales								General themes					
	TEC	OUT	SCI	CUL	ART	SER	BUS	ORG	R	I	A	S	E	C
R (5)	30	34	-02	-28	-13	-01	-05	-15	52	22	-01	16	13	17
I (4)	26	03	45	-20	-11	-03	-21	-16	38	63	06	10	06	28
A (3)	-30	-12	-11	32	50	-00	-14	-18	-07	20	85	26	-01	-14
S (5)	-06	03	-08	02	04	31	-10	-10	17	06	20	59	12	12
E (5)	-08	-16	-27	-00	-06	00	38	23	19	00	10	27	59	30
C (1)	12	-21	-14	-10	-18	-13	12	58	19	-11	-05	16	42	77
Occupational Scales														
R (19)	39	18	12	-39	-26	-03	02	01	55	23	21	10	24	37
I (33)	19	04	40	-03	-04	-11	-26	-23	21	58	11	-11	-15	02
A (19)	-37	-13	-15	42	41	04	-08	-17	-34	-03	57	01	-17	-40
S (20)	-25	-19	-11	19	13	34	00	-05	03	10	33	61	26	09
E (20)	-04	-19	-20	-12	-07	02	36	25	15	-06	-01	21	59	31
C (13)	16	-15	-16	-24	-24	-05	30	47	22	-17	-26	13	49	59

Note. Decimal points omitted. Number of scales in each group in parentheses.

General Themes have been listed in Table 5 which indicates as well the "incorrect" Theme with which the correlation was higher. These correlational results resemble very closely Manual Table 6-6 (pp. 61-63). Manual Table 6-6 also includes the mean scores of each occupational sample on the six Themes which mean scores were the most important scores in Campbell's classifying the SCII occupations into Holland's hexagonal arrangement. For example, Radiologic Technician was placed in the R group in spite of the fact that it correlated more highly with I in both male and female test construction samples. As can be seen from Table 5, here again X-Ray Tec correlated most highly in males and females with I. Table 5 reveals the following: (1) A and C (which are opposing groups) are the best defined in terms of occupations. (2) S with its "incorrect" correlations primarily in E and A is the next best conceptually defined group. The most troublesome occupation in S was Physical Therapist-m with higher correlations with R, but in the test construction samples as well, Physical Therapist-m was highly correlated with R, I, and S in both sexes. (3) The fourth "best" Theme in terms of occupational correlations was E where the most troublesome occupations were Chiropractor-m with its highest r with the opposing I Theme among males and Investment Fund Manager-m which was barely correlated with E among males (.11) and more correlated with A among females (.08). In Campbell's words Investment Fund Manager "resists classification." Another occupation in E that Campbell also found resistant was Lawyer, and here too, Lawyer-f and -m correlated most highly in both sexes with A. (5) The two poorest groups include I where the most outstanding discrepancy has to do with the many occupations with higher correlations with A: College Professor, Language Interpreter, Psychologist, Social Scientist, Speech Pathologist, occupations (except for the last) which fall into Roe's CUL group with its heavy emphasis on verbal activity. (6) Lastly, the R group revealed that Physical Education Teacher-f was a difficult occupation with its higher correlation with the opposing S Theme. The major discrepancy among occupations classified as R, however, was that they appear more E and C, particularly Army Officer.

Looking now at the VII, Tables 3 and 4 show the expected convergent and divergent relationships for both Basic and Occupational scales in both sexes: TEC and OUT always correlated most highly with R, SCI with I, CUL and ART with A, SER with S, BUS with E, and ORG with C.

Another way to judge the agreement between the SCII and VII was to classify the SCII Occupational Scales into Roe's system as was done in Table 2 for the Basic Interest Scales. Table 6 presents not only the means for the occupations classified into each Roe group, but the most and least representative occupations for each. For example, the TEC group had eight SCII occupations classified into it, the most

Table 5

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SCII Occupational Scales Correlated More Highly with an "Incorrect" General Theme

Females				Males			
Correct Theme	Occupational Scale	Incorrect Theme	<u>r</u>	Occupational Scale	Incorrect Theme	<u>r</u>	
R	Army Officer-f	E	.36	Army Officer-f	E	.31	
	Army Officer-m	E	.67	Army Officer-m	E	.56	
	Dietitian-m	E	.70	Dietitian-m	C	.62	
	Instr Assemb-f	C	.54	Instr Assemb-f	C	.54	
	PE Teacher-f	S	.34	Occ Therap-f	I	.60	
	Reg Nurse-m	I	.40	Reg Nurse-m	I	.43	
	X-Ray Tec-f	I	.53	X-Ray Tec-f	I	.60	
I	Dietitian-f	E	.56	College Prof-m	A	.41	
	Engineer-m	R	.75	Engineer-m	R	.76	
	Lang Interp-f	A	.35	Lang Interp-f	A	.43	
	Math Sci Teach-f	C	.63	Math Sci Teach-f	C	.65	
	Psychologist-m	A	.57	Psychologist-m	A	.65	
	Social Scientist-m	A	.31	Social Scientist-m	A	.48	
	Speech Path-f	A	.39	Speech Path-f	A	.47	
	Speech Path-m	A	.59	Speech Path-m	A	.77	
A	None			None			
S	Persn Dir-m	E	.71	Persn Dir-m	E	.64	
	Phys Therap-m	R	.61	Phys Therap-m	R	.60	
	Pub Adm-m	E	.63	Priest-m	A	.64	
				Pub Adm-m	E	.47	
E	Agr Bus Mgr-m	C	.60	Agr Bus Mgr-m	C	.55	
	Inv Fund Mgr-m	A	.08	Chiropractor-m	I	.47	
	Lawyer-f	A	.28	Home Ec Teach-f	S	.60	
	Lawyer-m	A	.39	Lawyer-f	A	.25	
	Pharmacist-m	C	.61	Lawyer-m	A	.54	
C	None			Banker-m	E	.58	
				Bus Ed Teach-m	E	.82	
				Credit Mgr-f	E	.71	

Table 6

Range and Mean of Correlations betweenSCII Occupational Scales Grouped by Roe's System and VII Scales

Roe	Among Male Counseling Clients		Among Female Counseling Clients	
	Range of Correlations within Group	Group mean	Range of Correlations within Group	Group Mean
TEC (8)	.51 for Computer Programmer-m to .67 for Skilled Crafts-m	.58	.17 for Computer Programmer-m to .50 for Merchant Marine Officer-m	.29
OUT (2)	.35 for Farmer-m to .58 for Forester-m	.47	.25 for Farmer-m to .58 for Forester-m	.42
SCI (36)	.00 for Dietitian-m to .63 for Medical Technician-m	.40	-.19 for Speech Pathologist-f to .69 for X-Ray Technician-f	.41
CUL (20)	.08 for School Superintendent-m to .65 for English Teacher-f	.46	.12 for Elementary Teacher-f to .62 for Librarian-f	.38
ART (12)	.13 for Advertising Executive-f to .60 for Entertainer-f	.44	.27 for Advertising Executive-f to .62 for Entertainer-f	.46
SER (16)	.01 for Highway Patrol Officer-m to .45 for Christian Educa Director-f	.25	-.02 for Highway Patrol Officer-m to .44 for Christian Education Director-f	.25
BUS (7)	.34 for Investment Fund Manager-m to .66 for Realtor-m	.49	.20 for Investment Fund Manager-m to .57 for Realtor-m	.45
ORG (19)	.20 for Public Administrator-m to .69 for Banker-f	.47	.21 for Public Administrator-m to .59 for Banker-f	.45

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Note: Number of occupations per group in parentheses. Unclassifiable: AF Officer-m, Army Officer-f, -m, Navy Officer-m.

representative of the TEC focus of activity being Skilled Crafts-m and Merchant Marine Officer-m. The "best" defined groups conceptually were TEC, OUT, ART, BUS, and ORG. SCI included such poorly related occupations as Dietician-m (more related to ORG), Mathematician (more related to CUL in females), and Speech Pathologist (more related to CUL and ART). CUL included such poorly related occupations as Elementary Teacher-f and -m (more related to SER), School Superintendent-m (more related to BUS in females and to SER in males), and Social Science Teacher-m (more related to SER). SER was the poorest defined group overall in both sexes with Highway Patrol Officer-m and Police Officer-m being more related to TEC, Flight Attendant-f more related to BUS, and Beautician-f more related to ORG in females, and BUS in males. Table 7 expands on the most representative occupations given in Table 6 by presenting the five SCII Occupational Scales most highly correlated with the VII in accord with prediction. The agreement in correlations between the sexes is very apparent here.

Thus, for both the SCII I Theme and the VII SCI group, the major problem is the tendency for certain occupations to slip towards the adjacent A or CUL groups, not a very serious deficiency. Likewise, the tendency of SCII R occupations to be more correlated with adjacent E is not serious. The most serious problems have to do with the VII SER and CUL groups: SER because it conceptually includes the notion of protective service -- FBI agents, firefighters, police chiefs -- which in Holland's scheme are primarily R; CUL because the close relationship between SER and CUL inherent in the teaching profession.

The last analysis to be presented is concerned indirectly with the validity of the SCII. Reference was made earlier to the kinds of sex differences on this test, i.e., that men obtain higher scores in the R, I, and E areas, and women higher scores in the A, S, and C areas. However, the present data allow a test of the hypothesis that such differences are diminishing in the college population. Women's liberation and increasing vocationalism in higher education have in the minds of some created a "new breed" of college women whose changed outlook includes the wish to pursue nontraditional careers (Wilson, 1975). One might even hypothesize that a comparison of men and women in extent of cross-sex equalization in occupational interests would reveal that the women were ahead of the men. Indeed, Frank and Kirk (1975), looking at male and female counseling clients in the University of California, Berkeley, College of Letters & Science, found little difference between male counselees and noncounselees, but differences between female counselees and noncounselees in the direction of counselees having cross-sex interests--Math-Science Teacher, Dentist, Laboratory Technician, Engineer--which were implied to be their motivation for seeking vocational guidance.

Table 7

Correlations for the Five SCII Occupational Scales Most Highly Correlated with VII Scales
as Predicted by Roe's System Among Two College Counseling Samples

Roe Groups								
TEC (8)	OUT (2)	SCI (36)	CUL (20)	ART (12)	SER (16)	BUS (7)	ORG (19)	
Skillcraft-m .67 (.46)	Forester-m .58 (.53)	X-RAY TEC-f .69 (.50)	EnglTeach-f .65 (.49)	ENTERTAINER-f .62 (.60)	ChrisEdDir-f .45 (.44)	Realtor-m .66 (.57)	BANKER-f .69 (.69)	
MMar Off-m .66 (.50)	Farmer-m .35 (.25)	OPTOMETRIST-m .65 (.53)	Librarian-f .63 (.62)	MUSICIAN-f .57 (.52)	GuidCouns-f .43 (.36)	Salesmgr-m .62 (.55)	CredMgr-f .63 (.62)	
Engineer-m .61 (.24)		PHARMACIST-f .65 (.58)	Librarian-m .63 (.58)	ARTEACH-f .54 (.47)	GuidCouns-m .43 (.38)	LIFEINSAG-f .52 (.51)	ACCOUNTANT-f .59 (.51)	
CompProg-f .59 (.28)		MED TECH-m .63 (.63)	Reporter-m .61 (.36)	Musician-m .52 (.48)	RecLeader-f .40 (.30)	LIFEINSAG-m .51 (.50)	Paralegal-m .59 (.58)	
Engineer-f .56 (.22)		PHY THERAP-f .63 (.56)	LangTeach-f .60 (.46)	Photograph-m .52 (.47)	SocWorker-m .39 (.34)	CompSales-m .43 (.40)	BUSEDTEACH-f .58 (.56)	

Note. Upper case letters indicate female sample, lower case male sample. First r for sample indicated;
I in parentheses for other sex sample. Number of SCII occupations per group in parentheses.

To test the hypothesis of increasing reduction of sex-stereotyping in occupational choice in this intelligent, educated segment of society, the two samples of counseling clients were compared by t-test with the scores on all scales ofSCII Women-in-General and Men-in-General samples (N = 300 each). The WIG and MIG Occupational Theme means and SDs may be found on page 33 of the Manual, the Basic Interest means and SDs on page 38, and the Occupational Theme means and SDs on pages 54 and 55.

For these 153 comparisons the differences between the two female samples were few, 16 or 10% of the possible differences at the .05 level. Table 8 indicates the direction of these differences. On the General Themes there were no differences and on the Basic scales WIG were more interested in Mathematics and Religious Activities while the counselees were more interested in Music/Dramatics. The few Occupational scale differences were spread evenly over the first five RIASEC areas with the only interpretable trend being that of the counselees to embrace artistic endeavors.

In contrast, the differences between the male counselees and MIG were appreciable--97 of 153 or 63% of the t-tests performed produced significant results. Table 9 is concerned with these differences and in addition to there being quantitatively more of them (10% vs. 63%), there is an obvious qualitative sex difference as well--the male differences are interpretable.

Compared to MIG, these male students seeking vocational counseling were less interested in the traditionally male R and E areas and more interested in the stereotyped female A area. The only departure from this trend was that MIG were more interested in the C Theme (and in the sole Basic Interest of Office Practices) which traditionally has been associated with female vocational interests.

Looking next at the Basic Interest Scales, again male counselees showed significantly less interest on R, I, and E scales and greater interest on the A scales of Art, Music/Dramatics, and Writing. Even the S scales, traditionally higher for women, on which MIG, contrary to prediction, scored higher were understandable from their content--Athletics and Religious Activities. Lastly, when the Occupational scales are considered, 79 or 64% of the differences were significant. They show male vocational counseling clients turning away from all R occupations except Registered Nurse, a stereotyped female occupation, and away from all E and C occupations. Again, while the shift in interest away from business is in line with departing from the male stereotype, the shift away from C occupations looks to be a rejection of low-level female stereotyped office occupations. A shift towards artistic occupations, like the R and E shifts was clear and consistent. The last two areas, which as General Themes showed no difference between MIG and college males, are I and S. Within I the shifts can be characterized as supporting the hypothesis, with counselees moving

Table 8

15

Direction of Significant Differences in Mean Scores between Female Counseling
Clients and Women in General on the Strong-Campbell Interest Inventory

Holland group	Scale	Greater mean
RIASEC	General Themes	none
Interest Scales		
R, E, C		none
I	Mathematics	W
A	Music/Dramatics	C
S	Religious Activities	W
Occupational Scales		
R	Army Officer (f)	C
R	Police Officer (m)	C
I	Dental Hygienist (f)	C
I	Language Interpreter (f)	C
I	Math-Science Teacher (f)	W
A	Advertising Executive (f)	C
A	Entertainer (f)	C
A	Musician (m)	C
S	Elementary Teacher (f)	W
S	Elementary Teacher (m)	C
S	YWCA Staff (f)	C
E	Department Store Manager (m)	C
E	Flight Attendant (f)	C
C		none

Note. $\bar{r}$ = 150 counselees; $\bar{n}$ = 300 women in general from Campbell (1974).

Table 9

16

**Direction of Significant Differences in Mean Scores between Male Counseling
Clients and Men in General on the Strong-Campbell Interest Inventory**

Holland group	Scale	Greater mean	Holland group	Scale	Greater mean
General Themes			Occupational Scales		
R	Realistic	M	R	Police Officer (m)	M
I,S	Investigative, Social	none	R	Skilled Crafts	M
A	Artistic	C	R	Voc. Agr. Teacher (m)	M
E	Enterprising	M	I	Biologist (m)	C
C	Conventional	M	I	Chemist (f)	M
Interest Scales			I	College Professor (m)	C
R	Agriculture	M	I	Computer Programmer (f)	M
R	Mechanical Activities	M	I	Computer Programmer (m)	M
R	Military Activities	M	I	Dental Hygienist (f)	C
R	Nature	M	I	Engineer (f)	M
I	Mathematics	M	I	Engineer (m)	M
I	Science	M	I	Lang. Interpreter (f)	C
A	Art	C	I	Mathematician (m)	C
A	Music/Dramatics	C	I	Math-Sci. Teacher (f)	M
A	Writing	C	I	Med. Technologist (f)	M
S	Athletics	M	I	Optometrist (f)	M
S	Religious Activities	M	I	Optometrist (m)	M
E	Business Management	M	I	Pharmacist (f)	M
E	Sales	M	I	Phys. Therapist (f)	M
C	Office Practices	M	I	Physician (f)	M
Occupational Scales			I	Psychologist (m)	C
R	Air Force Officer (m)	M	I	Soc. Scientist (m)	C
R	Army Officer (f)	M	I	Speech Pathologist (m)	C
R	Army Officer (m)	M	A	Advertising Exec. (m)	C
R	Cartographer (m)	M	A	Artist (f)	C
R	Farmer (m)	M	A	Artist (m)	C
R	Forester (m)	M	A	Art Teacher (f)	C
R	Highway Patrol Off. (m)	M	A	English Teacher (m)	C
R	Navy Officer (m)	M	A	Entertainer (f)	C
R	Nurse, Registered (m)	C	A	Int. Decorator (m)	C
			A	Language Teacher (f)	C

Table 9 (continued)

Direction of Significant Differences in Mean Scores between Male Counseling Clients and Men in General on the Strong-Campbell Interest Inventory

Holland group	Scale	Greater mean	Holland group	Scale	Greater mean
Occupational Scales			Occupational Scales		
A	Librarian (m)	C	E	Life Ins. Agent (f)	M
A	Musician (f)	C	E	Life Ins. Agent (m)	M
A	Musician (m)	C	E	Pharmacist (m)	M
A	Photographer (m)	C	E	Purchasing Agent (m)	M
A	Reporter (m)	C	E	Realtor (m)	M
S	Elementary Teacher (f)	M	E	Sales Manager (m)	M
S	Elementary Teacher (m)	C	C	Accountant (f)	M
S	Guidance Counselor (m)	M	C	Accountant (m)	M
S	Personnel Director (m)	M	C	Banker (f)	M
S	Priest (m)	C	C	Banker (m)	M
S	Nurse, Lic. Prac. (m)	C	C	Bus. Ed. Teacher (f)	M
S	Recreation Leader (m)	M	C	Bus. Ed. Teacher (m)	M
S	School Superintendent (m)	M	C	Credit Manager (f)	M
E	Agribusiness Manager (m)	M	C	Dental Assistant (f)	M
E	Buyer (f)	M	C	Department Store Sales (f)	M
E	Buyer (m)	M	C	Executive Housekeeper (f)	M
E	Chamb. of Comm. Exec. (m)	M	C	Nurse, Lic. Prac. (f)	M
E	Computer Sales (m)	M			
E	Credit Manager (m)	M			
E	Dept. Store Mgr. (m)	M			
E	Funeral Director (m)	M			
E	Lawyer (f)	M			

Note. n = 150 counselees designated C; n = 300 men in general from Campbell (1974) designated M.

towards "feminine" I occupations--College Professor, Dental Hygienist, Language Interpreter, Social Scientist--and away from "masculine" I occupations--Chemist, Engineer, Optometrist, Pharmacist. Within S occupations, the hypothesized differences between the two groups were least well supported, five being in favor of MIG, and three in favor of the male counselees--Elementary Teacher-m, Priest, and Licensed Practical Nurse.

These results support the notion that traditional sex-linked occupational interests are breaking down only in the male college population and that educated females continue to have vocational interests differing little from Women-in-General. This lack of change in educated women is like that observed by Scott, Fenske, and Maxey (1974) who studied community college students. Males were more likely over two years to change their vocational choice than females. The Holland groups showing the least change over time were the C and S groups, both dominated by females; the Holland groups to which people changed the most were the R and I groups both dominated by males. Thus, while Campbell (1974) feels that male-female differences in interests are not diminishing with time, Table 9 seems to say that change seems to be occurring at least among males, with the college experience predisposing some of them away from traditionally "masculine" occupational areas.

References

- Campbell, D.P. Manual for the Strong-Campbell Interest Inventory. Stanford, California: Stanford University Press, 1974.
- Frank, A.C. and Kirk, B.A. Differences in outcomes for users and nonusers of university counseling and psychiatric services: A 5-year accountability study. Journal of Counseling Psychology, 1975, 22, 252-258.
- Holland, J.L. Manual for Vocational Preference Inventory. Palo Alto: Consulting Psychologists Press, 1970.
- Holland, J.L. Making vocational choices. Englewood Cliffs, N.J.: Prentice-Hall, 1973.
- Holland, J.L. The Self-Directed Search. Palo Alto: Consulting Psychologists Press, 1974.
- Lunneborg, C.E. and Lunneborg, P.W. Factor structure of the vocational interest models of Roe and Holland. Journal of Vocational Behavior, 1975, 7, 313-326.
- Scott, C.S., Fenske, R.H., and Maxey, E.J. Change in vocational choice as a function of initial career choice, interests, abilities, and sex. Journal of Vocational Behavior, 1974, 5, 285-292.
- Wilson, K.M. Today's women students: new outlooks and new challenges. Journal of College Student Personnel, 1975, 16, 376-381.